Production of Biosurfactant as Potential Food Bioemulsifier by Bacillus Sp. Isolated From Sirri Island, Persian Gulf

Mohammad Ghayyomi*[1]; Fereidoun Forghani[2]; Sara Bon Khojasteh[2]

1-Department of Microbiology, Islamic Azad University, Tonekabon Branch, Iran

2-Department of Food Science and Biotechnology, Institute of Bioscience and Biotechnology, Kangwon National University, Chuncheon, Kangwon, South Koreia

mohammad_ghayyomi@yahoo.com

Background & Objectives: Biosurfactants are the surface-active molecules synthesized by microorganisms. Decreasing surface and interfacial tension, stimulating formation and stabilization of emulsions, controlling agglomeration of fat globules, stabilization of aerated systems and improving texture and shelf-life of starch containing products are among their applications.

Methods: The aim of this study was to isolate local Bacillus sp. from soils of Sirri Island in Persian gulf and evaluate them as potential biosurfactant producer. Samples were collected from 8 selected points of oil contaminated soils. Primary screening tests including hemolytic activity, drop collapse technique and oil spreading Methods were preformed and species with the best results were selected for complementary screening tests emulsification activity, foaming and surface tension measurement.

Results: Totally, 160 bacterial Strains were isolated which among them 59 Strains showed hemolytic activity, 46 had drop collapsing ability and 18 Strains showed positive results in emulsification, foaming and surface tension reduction tests. Finally, two Bacillus species were found to be able to reduce surface tension more than 30 mN/m and also with bioemulsification activity higher than 80%.

Conclusion: These two final strains can be considered as potential bioemulsifier producers to be used in food industry. Optimizing the final strains for maximum production and purification of the product for food safety assessment can be future goals to achieve worthwhile industrial results.

Keywords: Biosurfactant; Food; Sirri Island; Bacillus